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ABSTRACT

This guide, which is intended for British further education staff who work with special needs learners, examines the use of information and learning technology (ILT) to improve special needs learners' literacy. Part 1 discusses how information technology resources originally developed for mainstream programs can make information and learning materials accessible to students with physical or sensory impairments and how information technology can help teaching staff design and deliver programs that meet the needs of students with learning difficulties. The following topics related to using ILT with special needs students are discussed in part 2: choosing and using CD-ROMs; selecting software for a tutor's toolkit when on a budget; locating and using websites for and about students with disabilities and reluctant readers; and using hardware solutions (expanded keyboards, mini keyboards, keyguards, overlay keyboards, switches, emulators, touch screens, mice, tracker balls, joysticks, headpointers, mouthsticks). Presented in part 3 are case studies of the following: authoring in multimedia; using software to teach syntax to deaf students; and using images to improve learners' motivation. Part 4 lists the following: software discussed in the guide, software suppliers, contacts for specialist software, useful Internet addresses, resources and publications, relevant organizations, and specialist colleges. (MN)

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NCET

FEDA Further Education Development Agency

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Supporting the learner:

introducing ILT issues and teaching strategies to meet individual needs

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Sally McKeown

QUILT

NCET

FEDA Further Education Development Agency

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Quality in information and learning technology

The QUILT programme aims to support the development of information and learning technology in further education. The programme includes events, publications, multimedia resources, a consultancy service and development activities. These are focused on staff development and on enabling colleges to develop a response to ILT which encompasses staff, curriculum and resources.

About the author

Sally McKeown began her career as a tutor for the Workers Educational Association and then worked for many years as a lecturer in further education, initially in English and General Studies. She was seconded to Jaguar Cars as Press Officer in 1983. In 1985 she set up the Basic English and Numeracy Unit at Coventry Technical College for adulat literacy and special needs.

She started as project officer for post-16 special needs at the National Council for Educational Technology in September 1990, and is reponsible for the use of IT for all post-16 students with disabilities, learning difficulties or additional needs. She also supports developments in the use of IT for deaf learners and students with dyslexia across all age ranges. She is a freelance journalist for *The Times Educational Supplement* and a regular contributor to disability magazines in Britain.

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Introduction

This guide has been produced as part of the QUILT staff development programme in information and learning technology. It is necessarily the product of its time, reflecting current ideas, practices and software. Nevertheless, while technology marches on and hypertext gives way to multimedia, CD-ROMs and the Internet, good ideas for teaching and learning have a longer lifespan. Resources which describe classroom practice are like recipe books. Individual cooks never have exactly the same ingredients, conditions or tastes; nevertheless the essence gets passed on and is used in different formats by other people.

This publication is a compilation of all sorts of ideas and materials which others have shared with staff at the National Council for Educational Technology.

The guide is in four parts:

1 **Information about IT solutions to meet different kinds of learning needs:**

Basic skills, physical and sensory access, motivation

2 **Information about technology:**

CD-ROMs, a tutor's toolkit, the Internet, hardware solutions

3 **Case studies:**

New College Durham on using multimedia with adult literacy students

Coventry Technical College, Wilmorton College and Bradford and Ilkley Community College on software for deaf students

North Birmingham College on the IT, Art and Mental Health project

4 **Resources:**

Useful contacts, publications, resources and sources

1 Supporting learners

Computers and the programmes that run on them are advanced technological tools with widespread use. They are associated with employment and academic success, engineering and scientific progress. Unlike so many aids for disabled people or people with learning difficulties, information technology carries no 'special' connotations.

Much of the IT hardware and software solutions described in this guide were developed for – and are still generally used in – mainstream contexts. This section illustrates how IT applications can make information and learning materials accessible to students with physical or sensory impairments; and how IT can help teaching staff design and deliver programmes that meet the needs of students with learning difficulties.

IT TO IMPROVE LITERACY

Literacy is the key to learning. Visual or auditory impairments, even relatively minor ones, can affect the language and literacy development of many learners, as can other factors including social deprivation, inadequate education, lack of exposure to the printed word, dyslexia, or an episode of illness at a crucial age. IT offers support in several distinct but linked ways:

- help in diagnosing reading and writing difficulties
- remedial programs which tackle specific problems
- support for writers with dyslexia
- assistance for writers with poor basic skills.

Information technology is adjustable, non-judgemental and infinitely patient. Users can replay the same parts again and again and practise skills to their heart's content. They can alter the size of text or the colours of screen and text to suit their needs and preferences.

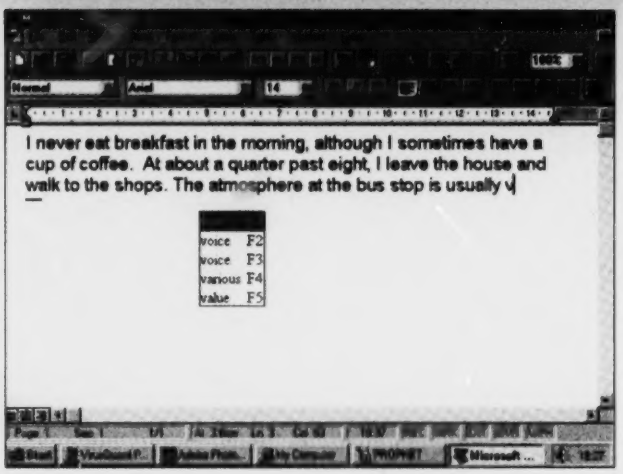
Learners can find support from remedial software, through spelling practice or more structured learning, such as integrated learning systems (ILS). These programs may have limited value in the context of lifelong learning: they tend to be designed for children, so their content is not necessarily appropriate for adults. They sometimes lack flexibility, making it difficult to match them closely to the needs of the student. Nevertheless, ILS programs that follow a logical scheme and have audio facilities, so the user sees and hears the word simultaneously, can be a real boon to some learners.

It is in support of the writing process that IT offers the greatest potential. Software tools, such as a spell-checker or thesaurus, offer help to all writers. Poor spelling and illegible handwriting are always a block to creative writing. Word processors encourage us to organise and develop our writing, to correct mistakes, to edit, extend and reorganise ideas. Once we are satisfied with the result, we can print out a perfect copy no matter how many amendments have been made.

A word processor with a speech facility is valuable for people with a range of disabilities. Students with a visual impairment, for example, may struggle to complete a sentence when they can only focus on one word at a time. This can affect not only writing, but students' understanding of text created by others,

such as an electronic message or a page from a printed book scanned into the computer. As the computer faithfully 'speaks' whatever is written, those who have problems in distinguishing between confusable words and letters can tell if they have selected the right spelling.

For writers who need help in creating even the shortest sentences, and those whose desire to communicate outstrips their facility with a keyboard, a predictive word processor offers an alternative to keying in every letter. When users key in a word, the program presents them with a list of likely words to follow, saving both effort and time. Most predictive word processors can incorporate the writer's personal vocabulary and therefore become increasingly supportive.


I never eat breakfast in the morning, although I sometimes have a cup of coffee. At about a quarter past eight, I leave the house and walk to the shops. The atmosphere at the bus stop is usually v
voice F2
voice F3
various F4
value F5

Prophet, a predictive word processor from the ACE Centre

Using a computer is itself a great motivator for adult learners. Computers are widely used. They are also highly personal tools, which enable learners to use their own vocabulary and create work which reflects their own interest.

At New College in Durham adult learners have regular access to word processors and desktop publishing programs to write their own books. For many of the students, the opportunity to produce a high-quality book with their own choice of subject and illustrations is a powerful motivator. It provides a useful product too, as these books become a reading resource for other students, on topics as diverse as child psychology and football.

Norah Watkinson at Llandrillo College has severe dyslexia and was filmed for National Council for Educational Technology TV using *Dragon Dictate*. She spent quite a lot of time on the 'enrolment period', when the user dictates sentences to the machine so that it becomes accustomed to her voice. Norah's tutor, David Mark Williams, thinks the enrolment period is crucial to the success of the project. 'We do 10 or 20 sentences at a time and then come back to it. It's really good fun to see it react to someone's voice and come up with what they say.'

Norah feels it has been a real breakthrough for her, 'It's one way of me knowing everyone else is going to be able to read what I have to say.'

A lecturer and student at the National Star Centre College, Gloucestershire, work with Dragon Dictate

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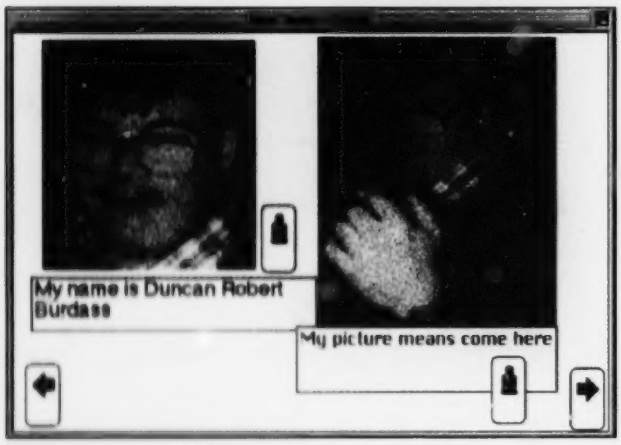
IT TO ENGAGE STUDENTS' INTEREST

It can be difficult to find activities for students with learning difficulties to undertake independently. Some colleges are exploiting the possibilities offered by presentation packages like *Powerpoint*. Designed for business presentations, these programs incorporate animated graphs, photographs and sound. Once set up, many can be operated with a single keystroke or mouse click.



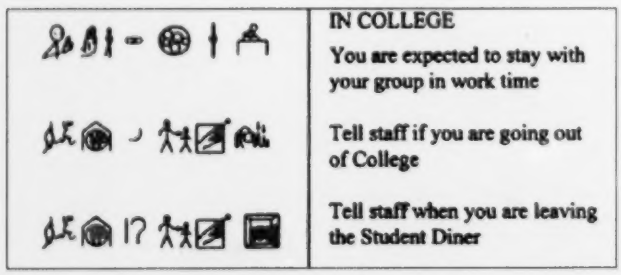
Students from East Yorkshire College use a presentation package in work towards their ASDAN award

Some adults with severe learning difficulties may never be proficient readers of standard text. There is increasing awareness that we do these learners a disservice by keeping them in adult literacy classes year after year if they are making little progress. They are likely to become understandably frustrated; they are also being denied the chance to access ideas and information from other sources.

The use of symbols as a means of communication is not new, but with information technology it is becoming much more widespread. *Writing with Symbols* is a program from Widgit software which produces a symbol for the words that you type. Various symbol systems – including *Rebus*, *Makaton*, *PCS* and *Compics* – can be used with the program. It is also possible to combine symbols and to create your own.

Symbols offer powerful support because they make people who are not conventionally literate into readers and writers. They can use symbols to record information, order it, learn, remember and reflect on it. Timetables, letters, reminders and notes can all be created in symbol form.

Sometimes symbols can give people access to information others have as a matter of course. The Country Code, the NHS Patients' Charter, and information from the Lottery Board and are all now available in symbol form. Andy Carmichael, a lecturer at West Suffolk College uses symbolised sheets for formative assessment. The college has also produced a symbol version of its Code of Conduct.

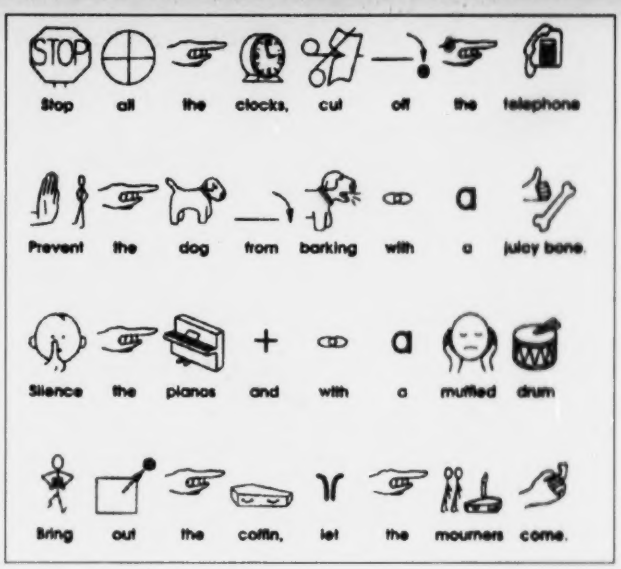

IN COLLEGE
You are expected to stay with your group in work time
Tell staff if you are going out of College
Tell staff when you are leaving the Student Diner

West Suffolk College's Code of Conduct in symbol form

Symbols can be used to give learners access to all forms of writing, not just factual information. Symbols can open up the world of poetry or drama, which many adults with learning difficulties enjoy and take an active part in. Symbols can help with learning lines or recalling particular beautiful phrases.

Further information about *Writing with Symbols* software and the ways it can be used to support adult learners is available on the following Internet sites:

http://www.widgit.com/adults1.htm and
http://www.widgit.com/adults.htm


Stop all the clocks, cut off the telephone
Prevent the dog from barking with a juicy bone.
Silence the pianos and with a muffled drum
Bring out the coffin, let the mourners come.

Symbols help students enjoy Auden's famous poem

IT TO SUPPORT STUDENTS WITH VISUAL IMPAIRMENTS

Lindsay is a 40-year-old woman with severe visual impairment. She came to the Swindon Access Computer Centre with very little in the way of literacy skills and now attends for twenty hours a week over five days. She uses a Horizon CCTV system to enlarge text on a 17" monitor to 150% of its normal size. She is then able to use Wordperfect 5.1 because of the multi-sensory support she is receiving. She memorises the keyboard, sees the characters on the screen, hears them read by the speech synthesiser, and feels her finger pressing the characters. She is now making real progress and her literacy skills are improving steadily following this multi-sensory use of IT.

Every learner is different. Some need print enlarged; others need a strong contrast between text and background. If the learner has a visual field problem, magnifying text may actually make it harder to read. Image, brightness and definition may be critical – a larger monitor or display may reduce the brightness and definition available.

Altering the size of text or the colours of screen and text may make all the difference to readers who find that the printed word 'swims' before their eyes.

All learners need good lighting, but some are sensitive to light and need to sit in a relatively shaded position with light falling only on the screen, the keyboard or the printed text.

Text

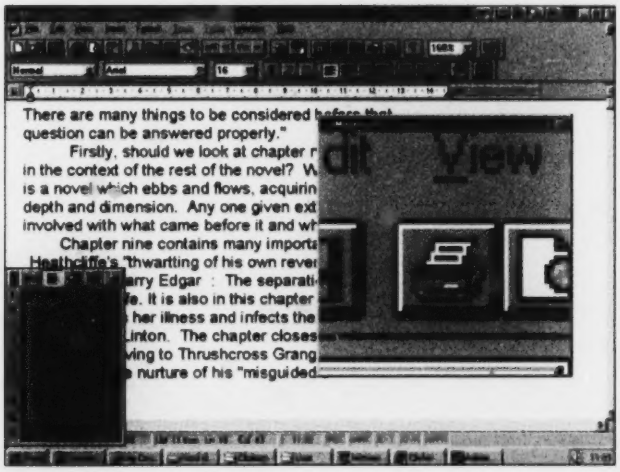
Word processors have a back-lit display, which makes type easier on the eye for most people. Some readers find that looking straight ahead at text, rather than looking down, helps with visual tracking. Many word processing programs allow the user to change the font and type size and colour of both text and background, so that users can select the combinations that are right for them.

Some systems have access utilities that allow the contrast, colour and size of the display to be adjusted for all software being used. Specialist access software also gives greater control over enlargement and help with screen navigation.

For example, in *Windows 95* you can use the 'Accessibility Options' in the Control panels to change the combinations of screen colours, font sizes and the size and type of mouse pointer.

Speech

Speech feedback is becoming common and much more sophisticated. Once it was only possible to get a tinny voice which could read back individual words. Now programs can read words or sentences or the whole document and give a choice of voices.


There are many things to be considered
question can be answered properly."
Firstly, should we look at chapter
in the context of the rest of the novel?
is a novel which ebbs and flows, acquirin
depth and dimension. Any one given ext
involved with what came before it and wh
Chapter nine contains many importa
Heathcliffe's "thwarting of his own revel
arry Edgar : The separati
e. It is also in this chapter
her illness and infects the
Linton. The chapter closes
ving to Thrushcross Grang
nurture of his "misguided
dit
View

TextHelp is a useful tool for readers with a visual impairment

Specialist speech software such as *Dragonspeak* or *Simply Speaking* can read back anything written on a screen, not just word processed text.

Speech input systems can be used to navigate around the screen. The new systems that turn speech directly into text are becoming cheaper and will be used more widely. Of course, the user still needs some sort of feedback system to check that the text is not gibberish. This might be a speech synthesiser, a text reader or Braille output.

TextHelp is a text enlargement and speech utility produced by Lorien Software. It works with your word processing package to give you extra features and help with reading, writing and visual impairment, including:

- speech and simple magnification for any Windows program; it provides a magnification window with an adjustable zoom factor from 200 to 500%
- real time spell-checking, which corrects errors as you type
- vocalised text which talks as you type; you can vary the pitch, speed and volume of all speech, and edit pronunciation with a dictionary manager, so it can cope with unusual, non-phonetic specialist terms or proper names.

Many learners – including those with physical disabilities or dyslexia – may also benefit from speech software facilities such as word suggestion and word completion, where lists of words appear on-screen. An abbreviations option, which stores abbreviations in a database makes it possible to enter a paragraph of a standard letter or an address, by pressing only three keys.

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2 The technology

Getting the message from CD-ROMs

CD-ROMs provide huge information sources in a very accessible form. Compare a CD with a reference book. An encyclopaedia fills twenty or so volumes, takes up a lot of shelf space and cannot be updated by the user. Why spend hundreds of pounds on a massive reference work, when the same information is available on CD-ROM for under £50? Why haul one volume after another off the shelf, when you can have all those wonderful search tools to bring the information to you? And how do you illustrate a complex process without video clips or animations? A plastic bag of CDs can contain all the information to be found in a library.

Many people with physical, sensory or learning disabilities rely on other people to provide their learning resources. There is a danger that they become passive recipients of information, allowing others to interpret ideas for them as well. CD-ROMs give the control back to the learner.

With an increasingly sophisticated range of search tools, learners can set off on their own voyages of discovery. Good readers scan through papers and books and often find things that catch their eye, leading them off into other areas of enquiry. This is less likely to be true for people who – for whatever reason – find reading difficult. A CD may offer many interesting routes through new information, with links to other unexplored topics.

Doncaster College for the Deaf has discovered that CD-ROMs can improve access to information. Many learners who have problems reading written English respond well to the photographs, videos and animations on CD-ROM. At Doncaster they have found the Encarta encyclopaedia particularly useful for helping students develop information retrieval skills. Some have used the information for City and Guilds 3793 Wordpower projects.

As a result of using the encyclopaedia, students have developed skills in information retrieval, cross referencing and alphabetical skills. In addition it has been noticeable that students with poor attention and/or concentration spans have improved in this area. The students have repeatedly commented on how much more in control they feel. One student aged 21 said, 'I don't feel like a student any more. I can find things on my own. I don't have to wait for staff to help me all the time.'

In 1992 The Open University and the RNIB developed an interface for text-based CD-ROMs with options for enlarged text or text-to-speech. Students were taught to use the system and provided with multimedia computers and headphones. Information could be saved and printed in Braille or in enlarged format. They suddenly had access to huge volumes of information – encyclopaedias, dictionaries, newspapers and the text of regular poetry and fiction. They could 'chance on' information as a sighted person might when flicking through a book. They could read round a subject, getting a variety of references and viewpoints, or they could decide that something was boring and go on to investigate from a different angle. Until this point they had always been dependent on someone else to provide them with their learning materials.

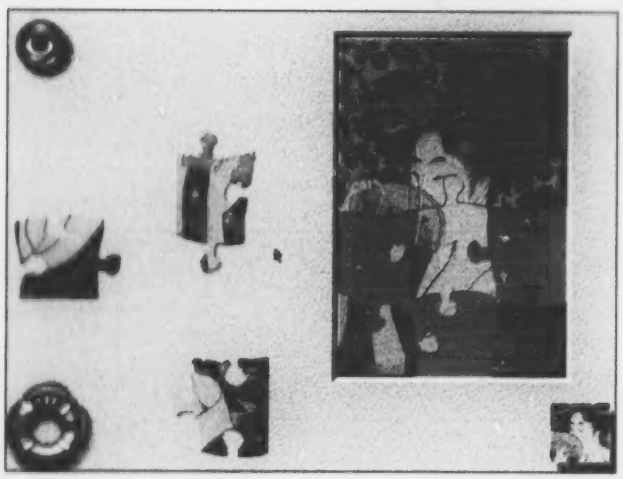
10 tips for choosing a CD-ROM

1. **Does it fit well with the curriculum?**
2. **Are buttons, menus** and icons clear?
3. **Is it biased culturally** or ethnically?
4. **What is the balance** of text, illustrations, **audio and video?**
5. **Is the vocabulary** and sentence length **suitable for your students?**
6. **Can you access** the information even if you **cannot spell?**
7. **Is there an audio** option?
8. **Is navigation easy?**
9. **Are there alternative** routes through **the material?**
10. **Can you print and save selected material?**

CDs often originate in video and film rather than printing, and use voice-over explanations and graphics together with text. This can be ideal for finding information sources at the right interest level for non-readers. The medium's multisensory nature gives learners more conceptual pegs to hang information on. It helps students to learn more, and to remember information more effectively.

A handful of ideas

- CD-ROMs excel at storing and displaying impressive graphics. *With Open Eyes*, from the Art Institute of Chicago, is accessible to virtually anyone. It contains over 200 works of art including paintings from such diverse artists as Dali and Renoir, as well as masks, photographs, kimonos, ceramics and statues. There is plenty of written information, but many users may prefer to click on the 'lips' icon and hear the text read aloud.
- There have been dictionaries for British Sign Language for many years. However, most of them are based on alphabetical order, which may be a foreign concept to signers. *Sign Now!!* is a welcome addition to the small range of bilingual materials available to deaf people in Britain. It covers more than 3,500 signs, including some regional variations. You can access a sign by typing in a word, clicking on a word, or clicking on a handshape. You can try the quiz or learn new signs by watching the relevant video clips, which can be slowed down or freeze framed.



With Open Eyes promotes active learning

Sign Now!! costs £59.00 for a single user copy and £119.00 for the network version. It is available from The Forest Bookshop, Tel: [01594] 833 858 (Voice/Minicom) or from Microbooks Ltd, Tel: [01932] 882 282, Fax: [01932] 882 283.

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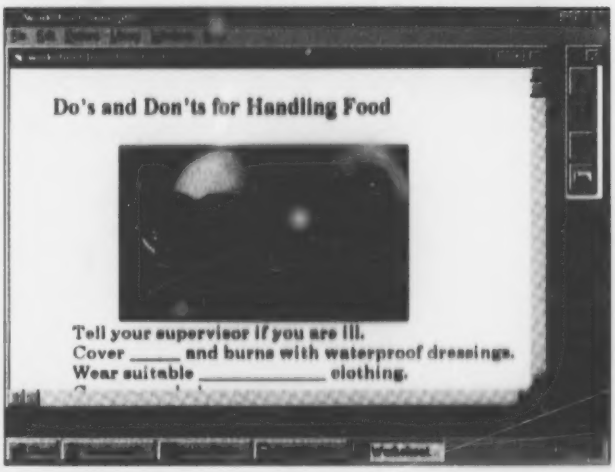
- From Yorkshire Interactive Thomson Multimedia comes the CD-ROM *Growing Up Together*. Users explore a block of flats to find out who lives there. One flat is occupied by Tom, who is disabled as the result of an accident; another has a Chinese girl adopted by an English family. The videos investigate themes such as death and bereavement, the generation gap and Jewish and Muslim festivals. They can be used as the basis for discussion and for recording students' own thoughts.
- *The Feelings Factory*, from SEMERC, has been developed by a team in Liverpool to promote discussion about such subjects as violence and inappropriate touching. Its aim is to help adults with learning difficulties and children to communicate their feelings and, perhaps, to discuss their own experiences. It uses images, sound and speech, and all of these can be adapted for any culture or language. The computer speaks to the interviewee, who responds by clicking on pictures and images. Its purpose is to start and to develop the process of communication, and is intended for use by individuals and groups working with a counsellor.

THE TUTOR'S TOOLKIT: SOFTWARE ON A BUDGET

It's all very well seeing these wonderful multimedia packages and hearing about the net, but I only have a budget of £100 a year for information technology.

This comment, from an FE lecturer at a National Council for Educational Technology conference, was echoed by others in the audience.

What can you do with such a small budget? Do you spend the whole lot on blank discs and printout paper? Do you buy £100 of ready-made software which will meet the needs of some of your learners and be totally irrelevant to the rest?


Do's and Don'ts for Handling Food
Tell your supervisor if you are ill.
Cover _____ and burns with waterproof dressings.
Wear suitable _____ clothing.

Developing materials for catering students using Worksheet Generator

Before you buy anything, check what you've got and see if you are making the best use of it. Many computers come with word processing and spreadsheet software; some have a database package as well.

- For students whose needs are not met by ordinary word processors, a 'whole word' word processing package is a useful purchase. This lists words onscreen which the learner can select with a mouse or a switch. This type of word processor is useful for disabled people who may find it tiring to type in every letter, and anyone with poor writing and spelling skills.
- Touch typing is a really useful skill. Recent research suggests that touch typing helps avoid repetitive strain injury. *Touch Type*, at £49.00 from SEMERC, may be a good buy
- *The Worksheet Generator*, from CTAD (£25.00), contains 250 worksheets to improve students' basic skills. These are referenced according to Wordpower criteria: reading text, reading graphics, reference material, filling

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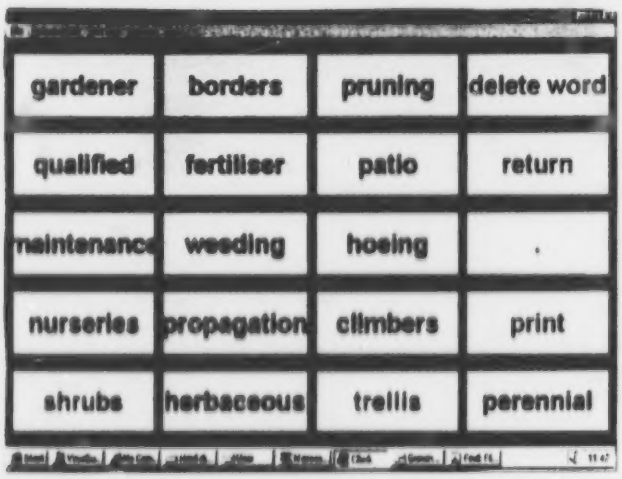
forms, formal writing and informal writing. You can change the fonts, sizes and styles to make the text more suitable for students with visual impairment or dyslexia.

- *Prophet*, from the ACE Centre, is a predictive word processor which displays suggested words. These can be selected by mouse, keyboard or switch. The lecturer can load in a dictionary of words on a particular topic so that only the words students need will appear.
- *Text Help*, from Lorien software (available from Inclusive Technology and SEMERC) sits on-screen above the word processed document and offers spell checking, speech output, word prediction, abbreviation expansion and screen magnification. It costs £85 for a single user, but can make all text accessible to learners with visual impairments or dyslexia.
- *Clicker Plus*, from Crick Computing (£55.00), allows you to create word lists on a grid, and to set up a system so that by clicking on one square you can launch an application such as a spreadsheet or calculator.
- *ThinkSheet*, from Fisher Marriott software, is a kind of electronic notepad where the student can jot down headings and then open a door in each one to add subsets of ideas. The computer will print out the ideas for each level or connect them as numbered points. It is also useful for developing an ongoing, easily updated, personal dictionary.
- *Mastering Memory*, based on the work of Buzan and Feuerstein, teaches a range of strategies to improve auditory and visual memory. The software is well designed and will be useful to students with dyslexia or those with memory loss resulting from head injuries. The software is available for PCs for £40.00. Communication and Learning Skills Centre (CALSC), 131 Homefield Park, Sutton, Surrey SM1 2DY. Tel: (0181) 642 4663



A Clicker Grid for horticulture students

- *Hyperstudio*, from TAG, requires little or no programming expertise. Options in dialogue boxes include most things students typically like to include in their first projects, such as sound, movies, graphics and animations. It runs on Mac or PC (single user £99.95).
- *Simply Speaking* for Windows 95 costs £99. The manufacturers, IBM, claim that it offers eyes-free and hands-free dictation at 70 to 100 words per minute, and is 90% accurate from the beginning. It also can learn up to 27,000 new words which might include names or research terms.

Surfing the Web

'It's not usually this slow!'

Nearly every demonstration of the power of the Internet is interspersed with these words, but it nearly always is that slow – particularly after lunch. The Internet does, however, contain a wealth of information.

- A partially-sighted student joining a user group can log on to the Royal National Institute for the Blind's World Wide Web server

  http://www.rnib.org.uk/

  to find out about the factsheets available from their Education Information Service.

- Ken Steven, of the School of Visual Language at Wolverhampton University has set up DeafUK, a database for most of the sites in the world which have information about interpreting and services for deaf people.

  http://www.wlv.ac.uk/www/depts/sles/deafuk/

  There is a user group for teachers and speech therapists to exchange ideas and information. There is also a local dimension. All students at Wolverhampton University can use it to find information about their courses, from room bookings to study guides. Ken hopes that it will spawn a Net journal to publish the best student writing.

Websites for disability information

Staff and students who need to find out more information about disabilities can access these websites:

The Multimedia Enabling Technologies Group
http://met.open.ac.uk/
These pages examine innovations in multimedia and 'enabling technologies' and how they can be used in teaching and learning.

Disabilities Access
http://www.healthworks.co.uk/daccess/da.html
An information service for disabled people and their facilitators. It includes factsheets on a variety of topics, a product directory and a list of organisations, disabled living centres and shopmobility centres.

Disability Net
http://www.disabilitynet.co.uk
A service for all disabled people and people with an interest in disability issues. Disability Net is run by Muscle Power which is an organisation of people with a Neuromuscular Impairment (NMI).

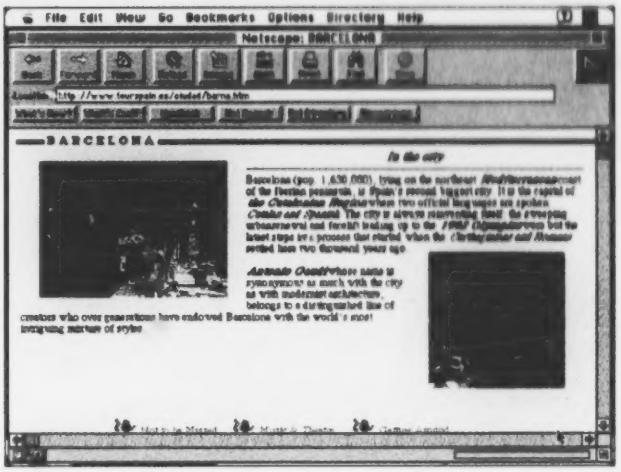
CANDO
http://cando.lancs.ac.uk/
A database which contains 'disability-related careers information of interest to British students in higher education, graduates, and university careers advisors'.

Disability Resources
http://www.disability.com/index.html
on the Internet from Evan Kemp Associates contains a wide variety of US disability-related information.

The Chatback Trust
Internet address: http://www.tens.co.uk/chatback/
provides electronic mail to relevant schools in the UK and abroad to enable students to e-mail penfriends. Students in Argentina, Australia, Canada, Estonia, Germany, Italy, Japan, Lithuania, Poland and the USA are communicating by e-mail.

See Section 4 for additional relevant sites.

Websites for reluctant readers



Travel pages from Spain

There are also some really useful Internet sites to motivate reluctant readers. Any subject that appeals to students can engage their interest in reading more about it. There are web pages on animals, from caring for pets, to the World Wide Fund for Nature, complete with tigers and sharks. There are pages for virtual travellers, chocoholics, cavers, surfers, and England Rugby fans.

Many web pages feature good graphics. Sainsbury's website is especially bright. The Triumph Motorbike website has details and images of the factory and the latest bikes, with some good features. For instance, you start in the paddock and then go through the pages from there. The clutch moves on the bike on the paddock page as you click to another page.

The list of website addresses in Section 4 is not definitive, nor even a list compiled by experts. It is just a collection of sites which people have enjoyed using and have passed on to others.

The Triumph Website

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Hardware solutions

A variety of devices are available which can make computers more accessible to people with a variety of physical disabilities. The devices connect to the computer either directly or through an 'interface'. Many of them were originally designed to save computer operators' time and effort in specialised commercial applications, and were only later adopted by disabled computer users.

Expanded keyboard

An extra large keyboard with large, well-spaced keys to reduce the likelihood of hitting the wrong key. The keys are recessed under a flat frame so that the user's hands can rest on the board.

Mini keyboard

A very small keyboard that can be operated by one hand. It requires good motor control, but less strength for pressing keys than an ordinary keyboard. Mini keyboards are also useful for people with restricted mobility who may find it difficult to reach a full-sized board.

A student at the National Star Centre using a keyguard

Keyguard

A frame which sits over the keyboard, with holes which equate to the keys. Users can rest their hands on the keyboard without accidentally typing extra letters. It is also useful for learners who find it difficult to strike one key accurately. The keyguard can be attached to the computer keyboard with velcro or similar fasteners and is easily removed when not required.

Overlay keyboard

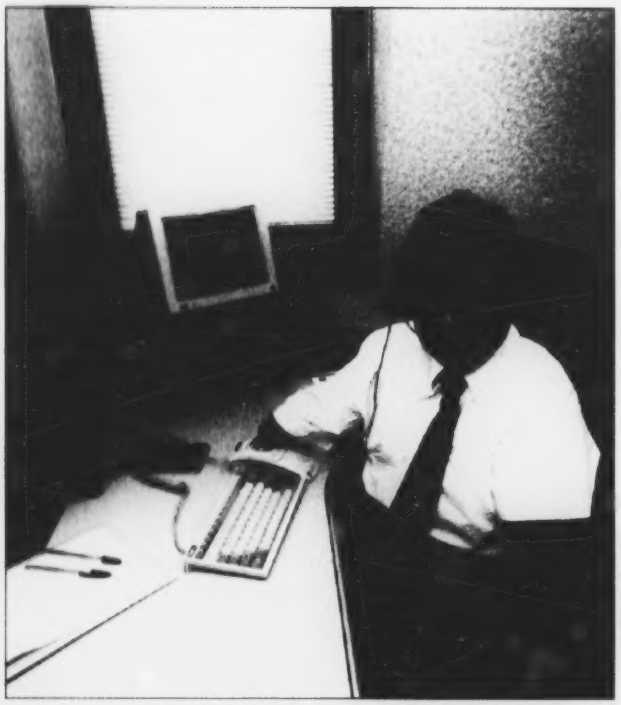
A flat, touch-sensitive board connected to the computer, on which paper overlays containing words or pictures can be placed. 'Text messages' can be associated with areas on the board, and are sent to the computer program when the board is pressed as though they had been typed in from the standard keyboard.

Switches

Anyone who has one controllable movement can use a switch to control a computer. Switches come in many different forms. The most common is a simple contact device that is pressed. Others are activated by sound or a light beam, or by squeezing, sucking or blowing. Switches can be used with specifically-designed switch software or they can operate more general software through an emulator. Proper seating is vital so that the user can control the switch without becoming overtired.

Emulators

An on-screen representation of the keyboard which is scanned horizontally and vertically. The user selects a key using a single keystroke, or a single or double switch. The scanning rate can be adjusted to suit the user, and there is an option for an audio prompt to indicate that a key has been chosen. An emulator can either be a separate device connected to a computer with its own screen, or it can be a software program that works in parallel with the application that the student is using. In that case the alternative keyboard appears on the main computer screen.



John Willis, a litigation lawyer, works with voice-recognition software, combined with a small keyboard and a tracker ball

Touch screen

A touch screen or touch window allows the user to control the screen directly with a finger or other pointer. The user can select items or draw by pressing the screen. It is normally used with specially-designed programs.

Mouse

Most computer software is now controlled by a mouse or other pointing device. The computer control panel allows you to alter the speed and size of the pointer. An infrared mouse is now available which may be useful for users with limited mobility.

Tracker Ball

An inverted mouse with a large ball. Some computer users find it easier to control fine movements with the tracker ball than with a mouse.

Joystick

A lever which can be pushed in different directions which may move a cursor or pointer around the screen. Used with a joystick 'button', it can select or mark out areas of the screen in the same way as a mouse.

Headpointer

A headpointer is a hands-free, non-electronic device which can be used to operate a keyboard, to draw or to turn pages. Fitting, adjustment and training are vital to avoid discomfort and damage to neck muscles.

Mouthstick

A mouthstick can be used to operate a keyboard, draw, turn pages or dial numbers on a hands-free telephone. Dental advice is essential for correct fitting.

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No matter how good a device is, it will only be effective if it is the right device for the particular learner – and only if the learner wants to use it. To ensure this, learners should have their needs properly assessed. An assessment will take account of the whole person and not just educational needs.

Where a switch input device is recommended, it should ideally be used for all access needs: computer, mobility and environmental control. The switch or other device should be as simple as possible, and should be firmly mounted to make the best use of muscle control. Correct seating is of vital importance if the user is to operate the device effectively without becoming tired or risking strain or injury to other parts of the body.

3 Case studies

AUTHORING IN MULTIMEDIA

Angela Lee and Steve Logan, from Learning Services at New College Durham, use multimedia to enhance basic skills work. Here they describe the process and the benefits of moving away from ready-made materials to authoring.

The Higginson Report emphasises the role of technology in providing exciting learning opportunities for a wider audience in Further Education. In our centre we use IT to encourage, support and drive the learning process.

We provide direct learning opportunities and support for over 600 students, aged 16 to 70+ years. The students are on a range of vocational and academic programmes with diverse study/learning patterns. Some are full time, others part time. Some attend formal classes, others a mixture of tutorials, workshops or self-access provision. There is a range of nationalities, first languages and culture. Study levels range from independent living skills to undergraduates.

Recently, we have developed our knowledge and skills of IT, particularly in multimedia. A year is a very short time in the context of lifelong learning, but it is an age in terms of developing technologies. Keeping up with technology is a dizzy experience; we are talking about very steep learning curves in IT!

In June 1994, we joined NCET's multimedia project for FE. We had already identified that multimedia opened up a wealth of information for individuals who would normally be unable or unwilling to cope with material that relied heavily on the written word.

An Open Learning Centre at New College, Durham

We had a number of ideas for creating 'home-grown' multimedia resources; many of these involved the production of learning materials that reinforced written and oral communication skills.

We decided to produce a multimedia college handbook, because we had found that much of the information provided to new students – however carefully checked for readability – was not likely to give our student group a good overview of the college. The rolling programme of enrolment throughout the year also meant that a formal induction was not always possible. Multimedia could use sound and vision to convey information that would otherwise be purely text or tutor-based. As well as making learners independent, it provided an opportunity to use modern computer technology and to raise the profile of the ABE service to mainstream staff and students.

In addition, there were excellent opportunities for accrediting communication and numeracy skills and it encouraged progression by providing a student's view of other courses on offer.

We had a small amount of funding from NCET, matched by funds from the college's IT budget. This purchased a faster multimedia machine with greater video and audio capabilities, authoring software and a still video camera.

As the project team came together, we quickly realised that some students naturally adopted roles suited to their particular aptitudes and interests. One or two found that the skills they had learned using word processors, spreadsheets and multimedia encyclopaedias could easily be transferred to multimedia authoring. These students became the 'assemblers', while others acted as writers, photographers and sound recordists.

We had decided quite early on that the ability to collect and present images familiar to our students was a high priority. For this we invested in a Canon ION camera, which can be operated with little or no previous experience of photography. This is particularly important because it is a dimension of multimedia authoring to which all students can contribute.

When students collect images, they can take many shots of the same subject and pick the best later. In an ION camera, up to 50 images can be stored on a video floppy disk which slots directly into the camera. The video floppy can be archived, or erased and re-used.

The sound facility allowed us to have text read back to users from the screen. This in turn provided opportunities for students involved in the authoring process to practise reading skills, pronunciation and vocal expression. Digital sound recorders allow you to speak into a microphone plugged directly into a computer. You can make several recordings and choose the version you like best.

We added only a short video clip to our multimedia induction. It was taken from a college marketing video, because we had little time for our own production. Digital video production is something we will certainly do more of in the future, although even short clips take up large amounts of disk space.

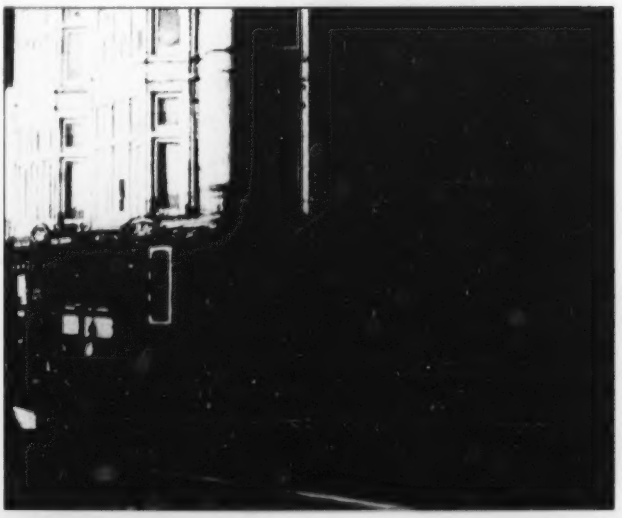

Photo of Harrogate taken with Canon ION camera

Collecting and combining familiar images and audio recordings with personal writing, and then processing them to produce high-quality paper or screen-based presentations, has been one of the most stimulating and rewarding experiences that we have been able to give our students. It has shown us that multimedia is not just about producing a product; it is a medium of self-expression. It opens up endless possibilities for new and innovative methods of developing literacy, numeracy and language as well as interpersonal and IT skills.

For early readers, we have found that a language experience approach can be adopted using multimedia authoring – the process and the product provides the visual and auditory reinforcement required for long-term memory of vocabulary. Students with specific learning difficulties have also found that the multisensory aspects of multimedia are particularly helpful in coping with complex textual material.

Many people regard multimedia merely as a product – a piece of courseware or slick *edutainment* – and overlook the process of creating multimedia and its value in developing a range of skills. If adults, including those with poor basic skills, are to be encouraged to participate in a society where broad band telecommunication networks allow multimedia to become a familiar means of sharing information, then they need to be encouraged to contribute to and become part of the revolution now.

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SYNTAX: TAUGHT OR CAUGHT?

Pam Haezewindt of the Comenius Centre in Leicester reports on work with deaf students at Bradford and Ilkley Community College, Coventry Technical College, and Derby College (Wilmorton).

As part of NCET's Focus on Deaf project, a group of colleges used *Fun with Texts*, a text manipulation program. This has been used extensively to teach modern foreign languages, so it seemed possible that it and similar software might have potential for deaf learners, who are often in the position of learning English as a second language. We hoped it would extend vocabulary, develop an understanding of written syntax and generally support developing literacy skills.

Teachers write text into the program and students can then work with it in a variety of ways. For example, they can re-order sentences in a passage or words in lists. They can try predicting the next word in a sequence; 'discovering' text on a storyboard; doing a cloze, or gapped-text, exercise.

One advantage is that the student is offered a variety of activities based on the same text. It enables learners to 'play' and experiment with words, phrases and texts in a safe environment. This raises awareness of structure, form and lexis and enhances reading skills and strategies. They learn to use clues and context as a guide to meaning.

Students can work with the program alone or in pairs or use it as a stimulus for group work. One group of students at Coventry Technical College worked in pairs, using the program to model and practise conversations for use with a Minicom, and to work with a model letter before writing their own letter about a group's holiday arrangements. They used mainly gapped text and storyboard ('copywrite') options. Instead of copying and substituting words from a model text to produce their own, students spent a lot of time 'exploring' the model text, seemed to absorb patterns and structures, and then made good attempts to write their own conversations and letters. Their tutor felt that the main advantages were that incorrect attempts to write 'evaporated' and students were left with a correct and pleasing piece of work.

At Bradford and Ilkley College, a profoundly deaf student built up a portfolio of work for the City and Guilds 'Wordpower' foundation certificate and prepared for part of the NVQ level 1 in Construction. His support teacher prepared a text about safety checks on a building site which they used to practise sequencing activities and for describing processes.

The software is particularly good for intensive work with 'difficult vocabulary' and texts containing the language of essential information that students need to acquire. It offers students practice with text in a stimulating and 'age-appropriate' way. One benefit was the independence that students experienced in working through exercises by themselves. They were able to gain feedback from the program and were not dependent on the teacher.

Although we used *Fun with Texts* for this project, similar programs are available, such as *DevTray* (the new version, *WinTray*, is available from LETSS). These programs enable the tutor to prepare a wide range of DARTs (Directed Activities Relating to Text) which are useful for anyone who needs to engage with text to improve language and literacy skills.

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USING IMAGES TO IMPROVE MOTIVATION

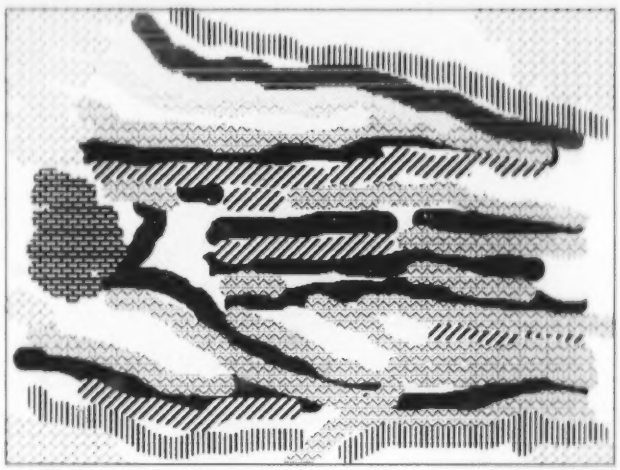
During 1996-97, NCET ran the IT, Art and Mental Health project in conjunction with a number of centres interested in using IT to develop artwork with adults with mental health problems. The project included a travelling exhibition and a website:

http://www.inclusive.co.uk

The following report from Maggi Henman of North Birmingham College describes her work with the Beechcroft Centre in Erdington.

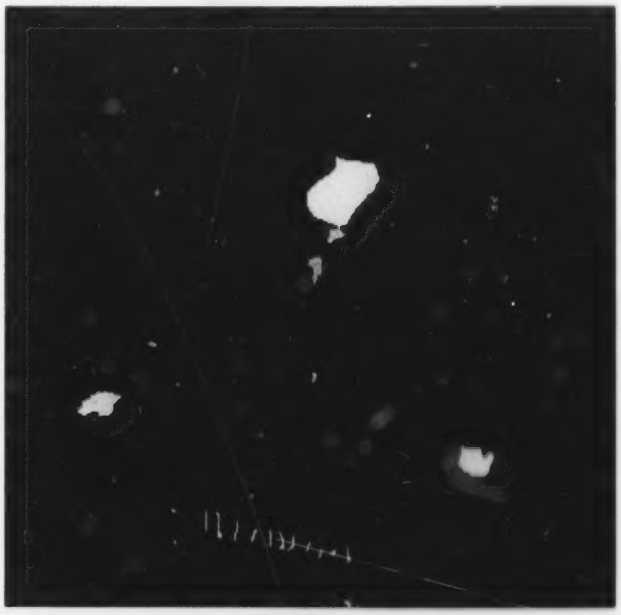
We have one three-hour session per week, although the computers are available at other times. Because of the nature of the users' conditions, attendance varies, but there is a core of six to eleven users and all are committed and keen.

There is a history of good artwork at the centre, and this project has been set up in a relaxed way in the main room of the centre. It often arouses interest from other users and the group is open to new members on a drop-in basis. Work is varied. Some use their own photographs or conventional drawings as a basis for their work. Individual users have developed a theme which runs through their work (for instance, animals, flowers, abstract shapes), but we have not worked with collective themes. It seems to be more successful to work with users' individual ideas and guide them through on a workshop basis, than to use formal teaching methods. Some interesting work has been produced and a selection was recently exhibited at the opening of a new resource centre at North Birmingham College.



Mac started drawing with colours, using aerosols and the fill tools. He said he couldn't draw, but as he went through the project, he developed confidence and realised he had artistic ability. A lot of his work is quite abstract: he has produced pictures of fire and wind. His picture 'Cowboy' has been chosen for the Web exhibition. 'Bombing of the newspapers' is one of his political pieces which is touring the UK from Glasgow to the Isle of Wight. Not bad for someone who 'can't draw'!

Using patterns on ClarisWorks (above), and Cowboy (below) by Mac



Printing and scanning are mostly done at the college, which causes only slight problems. The group were delighted to receive their own scanner, but disappointed when it was found to be faulty. It is hoped that these problems will soon be resolved, as work using the scanner has been particularly successful. It has attracted students who would otherwise not have joined. Anna, a wonderfully creative photographer, has scanned some of her photographs into the computer and then edited them. For example, she has coloured some of her black and white photos and edited others in *Corel Draw* to achieve different digital effects. It is like having another brush or tool – you can edit and expand the original and create new elements.

Fishing, by Anna

In terms of relaxation and self-expression, there are many advantages in using art with adults with mental health problems. Technology adds another dimension in that a good, professional outcome can be achieved in a short time. This is particularly advantageous for users with short concentration spans, or co-ordination difficulties due to their medication or their condition. Particularly noticeable is the considerable improvement in confidence of users since the project first started in September.

Examples of artwork can be found on Inclusive Technology's website:

http://www.inclusive.co.uk

Painting with Light, a video with artwork and poetry from the project, is also available from NCET (details are in Section 4).

4 Resources

Software referred to in the text

Package	*Price* *	*Supplier*
Clicker Plus	£55.00 (exc. VAT)	Crick Computing
Co:Writer	£199 (exc. VAT)	Don Johnston Inc
Encarta *CD ROM*	£49.99 (inc. VAT)	Microsoft
Feelings Factory *PC and Mac*	£49.00 single version £98 for a site licence	SEMERC
Fun with texts *PC*	£95 (exc. VAT)	Camsoft
Gapkit *PC*	£20 (inc. VAT)	Camsoft
Growing Up Together *PC and Acorn*	£59.99 disc pack £39.99 single disc	SEMERC
The Worksheet Generator *PC*	£25	CTAD
Hyperstudio *PC, Mac and Acorn*	£117.44 (inc. VAT)	TAG
Mastering Memory *PC*	£40	Communication and Learning Skills Centre (CALSC)
Powerpoint *PC and Mac*	£275	Microsoft
Prophet *PC*	£70 (exc. VAT)	ACE
Sign Now! *PC*	£59.00 single user £119.00 network	The Forest Bookshop
Simply Speaking *PC Win 95*	£73.45 (exc. VAT)	SEMERC
Text Help *PC*	£85	Lorien software available from Inclusive Technology and SEMERC
ThinkSheet *PC*	£39 (exc. VAT)	Fisher Marriott
Touch Type *PC and Acorn*	£42	SEMERC
WinTray *PC*	£48	LETSS
With Open Eyes *PC and Mac*	£29.99	Multimax
Writing with Symbols *PC and Acorn*	£60	Widgit

*All prices are valid at time of going to press

Supplier details

CALSC
Communication and Learning Skills Centre, 131 Homefield Park, Sutton, Surrey SM1 2DY. Tel: [0181] 642 4663

Camsoft
10 Wheatfield Close, Maidenhead, Berkshire SL6 3PS. Tel & Fax: [01628] 825 206

Crick Software Ltd
1 The Avenue, Spinney Hill, Northants NN3 6BA.
Tel: [01604] 671 691 Fax: [01604] 671 692

CTAD
Block D2, The Westbrook Centre, Milton Road, Cambridge CB4 1YG.
Tel: [01223] 582 582 Fax: [01223] 582 551

Don Johnston Special Needs
18 Claverdon Court, Calver Road, Winwick Quay, Warrington, Cheshire WA2 8QB.
Tel: [01925] 241 642 Fax: [01925] 2421 745

Fisher Marriott
3 Grove Road, Ansty, Warwickshire CV7 9JD. Tel & Fax: [01203] 616 325

Inclusive Technology
Saddleworth Business Centre, Huddersfield Road, Delph, Oldham OL3 5DF.
Tel: [01457] 819 790 Fax: [01457] 819 799

LETSS
The Lodge, Crownwoods School, Riefield Road, Eltham, London SE9 0AQ.
Tel: [0181] 850 0100 Fax: [0181] 850 0400

Multimax Ltd
Gloucester House, Station Rd, Sturton, Brigg, N. Lincs DN20 9DW.
Tel: [01652] 651 651 Fax: [01652] 654 568

NCET
Sales Department, Milburn Hill Road, Science Park, Coventry CV4 7JJ.
Tel: [01203] 416 669 Fax: [01203] 411 418

SEMERC YITM
1 Broadbent Road, Watersheddings, Oldham OL1 4LB.
Tel: [0161] 627 4469 Fax: [0161] 627 2381

SPA Ltd
PO Box 59, Tewkesbury, Gloucestershire GL20 6AB.
Tel: [01684] 833 700 Fax: [01684] 833 718

TAG Developments Ltd
25 Pelham Road, Gravesend, DA11 0HU. Tel: [01474] 537 886 Fax: [01474] 332 667

Widgit Software Ltd
102 Radford Rd, Leamington Spa, Warwickshire CV31 1LF.
Tel: [01926] 885 303 Fax: [01926] 885 293

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All names, addresses, telephone and fax numbers, e-mail addresses and websites have been confirmed as of November 1997

Contacts for specialist software

Alphavision Ltd
North's Estate, Piddington, High Wycombe, Bucks HP14 3BE.
Tel: [01494] 883 838 Fax: [01494] 881 211 e-mail: access@alphavis.demon.co.uk

Dolphin Computer Access Ltd
PO Box 83, Worcester, Worcestershire WR3 8TU.
Tel: [01905] 754 577 Fax: [01905] 754 559

Sensory Systems
1 Watling Gate, 297-303 Edgware Road, London NW9 6NB.
Tel: [0181] 205 3002 Fax: [0181] 205 1192

Sight & Sound Technology
Qantel House, Anglia Way, Moulton Park, Northampton NN3 6JA.
Tel: [01604] 798 070 Fax: [01604] 798 090

Techno-Vision Systems Ltd
76 Bunting Road, Industrial Estate, Northampton NN2 6EE.
Tel: [01604] 792 777 Fax: [01604] 792 726 e-mail: robotron@delphi.com

Useful addresses on the Internet

Disability information

The Basic Skills Agency (formerly ALBSU)
http://www.basic-skills.co.uk/

British Computer Society (BCS) Disabled Specialist Group
http://www.bcs.org.uk/

British Dyslexia Association (BDA)
http://www.bda-dyslexia.org.uk/

CALL Centre: Communication Aids for Language and Learning
http://call-centre.cogsci.ed.ac.uk/CallHome

CanDo Disability Careers Network
http://cando.lancs.ac.uk/

Charities on FutureNet
http://www.futurenet.co.uk/charity/index.html

Closing the Gap: Microcomputer technology for people with special needs
http://www.closingthegap.com

Deaf World Web
http://deafworldweb.org/

Disability Net
http://www.disabilitynet.co.uk/

Dorton House School Access Technology Services
http://www.dorton.demon.co.uk/ATS/atshome.htm

The Dyslexia Archive – Specific Learning Difficulties
http://www.hensa.ac.uk/dyslexia.html

Dyslexia Institute
http://www.dyslexia-inst.org.uk/

Healthworks Online: Disabilities Access
http://www.healthworks.co.uk/daccess/DA.html

Inclusive Technology
http://www.inclusive.co.uk/

The Multimedia Enabling Technologies Group
http://met.open.ac.uk/

The National Autistic Society
http://www.oneworld.org/autism_uk/index.html

National Center to Improve Practice in Special Education Through Technology, Media and Materials
http://www.edc.org/FSC/NCIP/

National Council for Educational Technology (NCET)
http://www.ncet.org.uk/

Royal National Institute for the Blind (RNIB)
http://www.rnib.org.uk/

Scope
http://www.scope.org.uk/

Scottish Council for Educational Technology (SCET)
http://www.scet.org.uk/

Solutions from disability.com
http://disability.com/index.html

Widgit Software for Learning Difficulties
http://www.widgit.com/

Widgit Software for Adult Learners
http://www.widgit.com/adults.htm

Websites for reluctant readers

The following is a collection of sites which some people have enjoyed using and have passed on to others.

Animals

Pet Care and Nutrition on **http://www.waltham.com/**
Doggy topics on **http://www.k9.co.uk/**
Cats are found on **http://www.cats.org.uk**
The World Wide Fund for Nature complete with tigers, sharks and the online gift shop
http://www.wwf-uk.org/

Travel

Visit Spain **http://www.tourspain.es/**
or Egypt **http://www.city.net/countries/egypt/maps/**
For map lovers **www.vtourist.com/webmap/**

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Food

Sainsbury's **http://www.sainsburys.co.uk/index.html**
For chocoholics **http://www.cadbury.co.uk/**
For vegetarians **www.vegetariantimes.com/**

Hobbies

Og of Draenen is accessible on:
http://ndacromwell.nd.rl.ac.uk/instr/loq/steve/caving/draenen/draenen.htm
South Wales Caving club **http://ylem.anat.ucl.ac.uk/external/swcc/**
Gardening **http://www.gardening-uk.com/** Also try **http://www.rhs.org.uk/**
Triumph Motorbikes **http://www.triumph.co.uk/index.html**

Sports

Windsurfing **http://wmi.cais.com/www/windsurf/index.htm**
England Rugby fans (not a boozers' site!) **http://www.scrumpyjack.com/**
And, finally, a health magazine **http://www.balance.net/**

Great graphics/odds and ends

Disney **http://www.disney.com/**
Cyberia **http://www.cyberiacafe.net/index.html**
Images **http://www.imaging.co.uk/imageuk/imageuk.htm**
The Postcard Store **http://postcards.www.media.mit.edu/postcards/**
Women's Wire magazine on **http://www.women.com/guide/**
Weather **http://www.meto.govt.uk/**

Resources and publications

Access to Words and Images (book) £5.00, NCET
A clear, concise guide to help tutors using IT to support students with physical disabilities.

Choosing and Using IT Equipment (resource pack) £6.50, NCET
A wealth of information to help you make the right choices when purchasing new equipment, and to make the best use of existing IT equipment.

Computer-Assisted Guidance: Using IT to provide careers and educational guidance (resource pack) £45.00, NCET
This pack is a unique seven-module distance learning course, explaining guidance work and computer use for the uninitiated.

Envision (NCET's subscription magazine) £7.50, NCET
Published termly, Envision reports on a wide range of multimedia issues in a lively, informative and jargon-free way.

Focusing on Deaf People (book) £5.00, NCET
Find out about software, hardware and recent developments designed to improve the communication skills of deaf people.

IT, Disability and Lifelong Learning (book) £5.00, NCET
For students with disabilities, IT is a tool for lifelong learning, particularly as it has expanded the range of work opportunities.

IT for Adults with Dyslexia (book) £3.50, NCET
An estimated six million adults in Britain struggle with reading and writing. This informative book looks at useful tools across the software spectrum and uses many short case studies to highlight specific problems and practical solutions.

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Libraries of the Future (staff development pack) £12.50, NCET
Concentrating on the use of multimedia – including authoring software and the Internet – this pack examines strategies for developing information skills and managing resources.

Painting with Light (video) £6.50 incl VAT, p&p, NCET.
This video features artwork and poetry from the project. If you would like a copy please send your postal details and a cheque (we are unable to invoice) payable to NCET to: The Bookshop, NCET, Milburn Hill Road, Science Park, Coventry CV4 7JJ.

Reviewing IT in FE (book) £15.00, NCET
This in-depth guide covers the management of IT, on-site support for IT and the practice of IT teaching and learning, all aimed at enabling your college team to define comprehensive quality standards.

Supporting Visually Impaired Students in FE (book) £3.50, NCET
Definitions of visual impairment, causes of sight loss and a glossary of terms used to describe vision form a helpful introduction to the analysis of specific problems and of equipment and materials. Large print.

Tecknowledge.able (video and handbook) £22.50 incl p&p, University of Wolverhampton
This video demonstrates what technology can achieve for students with learning difficulties. Available from: The Equal Opportunities Unit, Higher Education Shop, University of Wolverhampton, 62-68 Lichfield Street, Wolverhampton WV1 1DJ.

Relevant organisations

AbilityNet – see also the Computability Centre and the Foundation for Communication for the Disabled
Hassel House, Link Industrial Estate, Malvern, Worcs WR14 1UQ
Tel: [01684] 563 684 Fax: [01684] 576 188 e-mail: paul@soundcom.org.uk
As of 1 January 1998, the Computability Centre and the Foundation for Communication for the Disabled are merging to form AbilityNet. The combined organisation will offer a complete range of services to disabled people who need advice on computer technology, including a free telephone helpline, individual assessment, courses, consultancy for employers, and supply and support for fully-adapted computers.
With offices currently at Warwick, Malvern and West Byfleet (alternate addresses listed under the predecessor organisations), the AbilityNet will work with partners to establish regional centres across the country.

The Basic Skills Agency (formerly ALBSU)
http://www.basic-skills.co.uk/
Commonwealth House, 1-19 New Oxford Street, London WC1A 1NU
Tel: [0171] 405 4017 Fax: [0171] 400 6626
The national agency for basic skills in England and Wales. The Unit provides consultancy and advisory services, funds projects, undertakes research and produces a wide range of teaching and learning materials.

British Computer Society (BCS) Disabled Specialist Group
http://www.bcs.org.uk/
Geoff Busby, BCS, GEC Marconi Research Centre, West Hanningfield Road, Great Baddow, Chelmsford, Essex CM2 8HN
Tel: [01245] 242 950 Fax: [01245] 478 317
The Disabled Specialist Group is an active sector within BCS whose activities include providing information and advice, running conferences and producing an informative newsletter called *Ability*.

British Deaf Association

1-3 Worship Street, London EC2A 2AB. Tel: [0171] 588 3520 Fax: [0171] 588 3527
The British Deaf Association is a democratic, membership-led charity campaigning on behalf of deaf people in Britain. It has several main service areas, with teams covering education and youth, information, health promotion, video production and community services, offering advice and help .

Computability Centre – see also AbilityNet
http://www.bcs.org.uk/computab/index.htm

P.O. Box 94, Warwick CV34 5WS. Freephone: [0800] 269 545
Tel: [01926] 312847 Fax: [01926] 311345 e-mail: tccadmin@bham.ac.uk
This is a national charity which provides a freephone advice and helpline on all aspects of computing and disability, including RSI. Undertakes assessments and runs open days for disabled individuals and awareness courses for employers and health care professionals.

Foundation for Communication for the Disabled – see also AbilityNet

Beacon House, Pyrford Road, West Byfleet, Surrey KT14 6LD
Tel: [01932] 336 512 Fax: [01932] 336 513
This is a non-profit making organisation supplying computers to disabled people and providing after-sales support.

National Council for Educational Technology
http://www.ncet.org.uk/

Milburn Hill Road, Science Park, Coventry, West Midlands CV4 7JJ
Tel: [01203] 416 994 Fax: [01203] 411 418 e-mail: enquiry_desk@ncet.org.uk
NCET produces publications, provides information about learning difficulties and is currently exploring how e-mail, electronic mailing lists and information available throughout the World Wide Web can provide a new and effective service for teachers and others supporting students with special educational needs.

National Federation of ACCESS Centres

The South West Regional Access Centre, University of Plymouth,
Drake Circus, Plymouth PL4 8AA
Tel: [01752] 232 278 Fax: [01203] 232 279 Minicom: [01752] 232 285
This is a national network of specialist centres in further and higher education which seeks to support and empower students with physical disabilities, sensory impairment or learning difficulties. Each centre offers an assessment service and can provide training.

Royal Association for Disability and Rehabilitation (RADAR)

Unit 12, City Forum, 250 City Road, London EC1V 8AF
Tel: [0171] 250 3222 Fax: [0171] 250 0212
RADAR is a national voluntary organisation campaigning for the rights of people with physical disabilities. Services include providing information on education, housing, mobility and holidays.

Royal National Institute for the Blind (RNIB)
http://www.rnib.org.uk/

224 Great Portland Street, London W1N 6AA
Tel: [0171] 388 1266 Fax: [0171] 388 2034
The Institute produces a wide range of information and magazines, including Eye Contact and Visibility, which regularly look at the use of information technology for visually-impaired children with or without additional needs.

Royal National Institute for Deaf People (RNID)

19-23 Featherstone Street, London EC1Y 8SL
Tel: [0171] 296 800 Minicom: [0171] 296 8001 Fax: [0171] 296 8199
The RNID provides training and support, and promotes technology for deaf people.

Scope (formerly the Spastics Society)
http://www.scope.org.uk/
12 Park Crescent, London W1N 4EQ. Tel: [0171] 636 5020 Fax: [0171] 436 2601
Microtechnology Service, Tel: [01763] 260 771
Cerebral Palsy Helpline, Tel: [0800] 626 216
Scope is the largest charity in this country working with people with cerebral palsy and their families and carers. The microtechnology service does assessments and manufactures specialised electronic equipment. The cerebral palsy helpline is available 9 am to 9 pm weekdays and 2 to 6 pm weekends for advice, information and support.

Scottish Dyslexia Association
Unit 3, Stirling Business Centre, Wellgreen, Stirling FK8 2DZ
Tel: [01786] 446 650 Fax: [01786] 471 235 e-mail: dyslexia.scotland@dial.pipex.com
The SDA is a national voluntary organisation aiming to raise public awareness of dyslexia and its related difficulties. Printed information, advice and support for dyslexic people of all ages is available. A resource centre at the above address is open 9–5 Monday to Friday.

Scottish Council for Educational Technology (SCET)
http://www.scet.org.uk/
74 Victoria Crescent Road, Glasgow G12 9JN
Tel: [0141] 337 5000 Fax: [0141] 337 5050
SCET produces a wide range of software and training materials, many of which support learners and professionals with learning difficulties. SCET also runs a Bulletin Board called CONTACT.

Skill: National Bureau for Students with Disabilities
336 Brixton Road, London SW9 7AA. Tel: [0171] 274 0565 Fax: [0171] 737 7477
Information office Tel: [0171] 978 9890 Monday to Friday 1.30 – 4.30 pm
A voluntary organisation which offers an information service (voice/minicom) to students with disabilities and/or learning difficulties or people working with them. Publications and information leaflets are available. Skill also offers a membership scheme with newsletters and a journal.

Specialist Colleges

Banstead Place
Park Road, Banstead, Surrey SM7 3EE
Tel: [01737] 356 222 Fax: [01737] 359 467
Banstead Place is a residential centre offering assessment, rehabilitation and education to young people who have acquired disabilities as a result of brain injury.

Beaumont College
The Principal, Beaumont College, Slyne Road, Lancaster LA2 6AP
Tel: [01524] 64278 Fax: [01524] 846 896
This is a SCOPE College of Further Education for 16 to 25-year-olds with physical disabilities and/or learning difficulties.

The David Lewis Centre
Mill Lane, Warford, Nr. Alderley Edge, Cheshire SK9 7UD
Tel: [01565] 640 000 Fax: [01565] 640 100
This Continuing Education Unit offers a wide range of Leavers programmes designed to prepare students over age 16 for independence and integration.

Derby College for Deaf People
Ashbourne Road, Derby DE22 3BH. Tel: [01332] 297 550 Fax: [01332] 206 642
This residential college teaches a wide range of academic and vocational courses to deaf and hearing impaired young people.

Derwen College
Oswestry, Shropshire SY11 3JA. Tel: [01691] 661 234 Fax: [01691] 670 714
This independent residential college is committed to promoting the education, social and personal development of young people with disabilities and/or learning difficulties.

Dilston College of Further Education
Corbridge, Northumberland NE45 5RJ. Tel: [01434] 632 692 Fax: [01434] 633 721
This MENCAP college offers residential further education courses to young people with learning difficulties aged 16 and over.

Hereward College
Bramston Crescent, Tile Hill Lane, Coventry CV4 9SW
Tel: [01203] 461 231 Fax: [01203] 694 305
The national integration college for students with physical and sensory disabilities.

Hinwick Hall College of Further Education
Hinwick, Nr. Wellingborough, Northants NN29 7JD
Tel: [01933] 312 470 Fax: [01933] 412 470
The college educates, trains and supports young people with disabilities in a caring residential environment.

Lindeth College of Further Education
The Oaks, Lindeth, Bowness-on-Windermere, Cumbria LA23 3NH
Tel: [015394] 46265 Fax: [015394] 88840
This residential college offers further education to students with learning difficulties.

Linkage Community Trust
Weelsby Hall Further Education College, Weelsby Road, Grimsby, South Humberside DN32 9RU. Tel: [01472] 361 334 Fax: [01472] 242 375
Linkage is a national charity with two residential further education colleges for 16 to 25-year-olds with learning or physical disabilities, sight or hearing loss, epilepsy, autism or other widely varying difficulties.

Lord Mayor Treloar National Specialist College of Further Education
Holybourne, Alton, Hants GU34 4EN
Tel: [01420] 547 400 Fax: [01420] 542 708
This residential college runs a flexible programme for students with learning difficulties which is accredited externally through the Youth Award Scheme.

Lufton Manor College
Yeovil, Somerset BA22 8ST. Tel: [01935] 423 124 Fax: [01935] 706 841
This residential college caters for students with severe learning difficulties and some associated needs.

National Star Centre College of Further Education
Ullenwood, Cheltenham, Gloucestershire GL53 9QU
Tel: [01242] 527 631 Fax: [01242] 222 234
This residential college caters for students aged 16 to 25 with physical or sensory disabilities.

Paduan Residential College
Derby Road, Southport, Sefton, Merseyside PR9 0TZ
Tel: [01704] 534 433 Fax: [01704] 549 711
This independent, residential college caters for students with moderate and severe learning disabilities and associated behavioural and emotional difficulties.

Portland College
Nottingham Road, Mansfield, Notts NG18 4TJ
Tel: [01623] 792 141 Fax: [01623] 798 798
This residential college provides education and training for all ages and across a whole range of physical disabilities.

Queen Alexandra College
Court Oak Road, Harborne, Birmingham B17 9TG
Tel: [0121] 428 5050 Fax: [0121] 428 5048
The college provides further education and vocational training for both school leavers and adults.

Queen Elizabeth's Training College
Leatherhead Court, Leatherhead, Surrey KT22 0BN
Tel: [01372] 842 204 Fax: [01372] 844 156
This residential training centre offers a range of vocational courses to any disabled person aged from 19 to 59, except the totally blind.

RNIB Redhill College
Philanthropic Road, Redhill, Surrey RH1 4DG
Tel: [01737] 768 935 Fax: [01737] 778 776
This is a co-educational college providing further education and vocational courses for visually impaired school leavers and adults.

RNIB Vocational College
Radmoor Road, Loughborough, Leicestershire LE11 3BS
Tel: [01509] 611 077 Fax: [01509] 232 013
In association with Loughborough College, this college offers a unique package of training and educational opportunities for visually impaired people.

Royal National College for the Blind
College Road, Hereford HR1 1EB. Tel: [01432] 265 725 Fax: [01432] 353 478
Further education and training is offered to blind or partially sighted people between the ages of 16 and 59.

St Loye's College
Topsham Road, Exeter EX2 6EP. Tel: [01392] 255 428 Fax: [01392] 420 889
St Loye's College provides quality training for people aged 18 to 63 with disabilities and long-term health problems, so that they are able to compete on equal terms in employment.

St Piers Lingfield
St Piers Lane, Lingfield, Surrey RH7 6PW Tel: [01342] 832 243 Fax: [01342] 834 639
This co-educational residential establishment specialises in the education and medical treatment of students with epilepsy and neurological disorders. The age range is 15 to 19-year-olds and learning difficulties range from moderate to severe.

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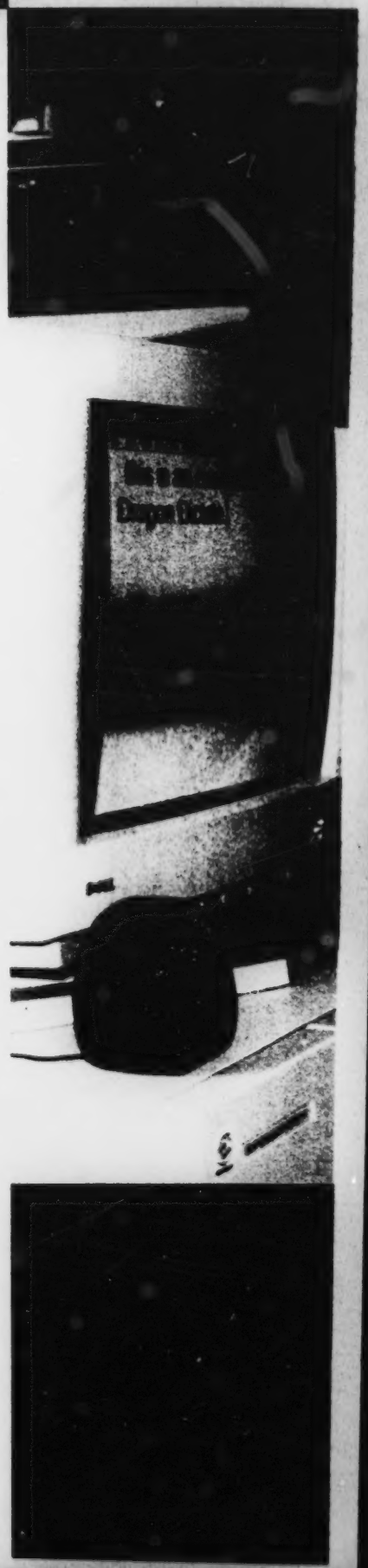
QUILT

Supporting the learner: introducing ILT issues and teaching strategies to meet individual needs

This guide has been produced as part of the QUILT further education staff development programme. It is a compilation of ideas and materials which practitioners have shared with staff at the National Council for Educational Technology.

Supporting the learner provides information about a wide range of IT solutions to meet the individual needs of disabled students or those with learning difficulties. The guide includes case studies from colleges that have used these solutions successfully, and it lists resources including contacts, publications and software, and sources of materials and equipment.



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